Dover, 21st, 27th.

New York.—Albany, 1st, 11th; Oswego, 9th, 11th, 20th; Palermo, 9th, 11th, 22d; Ithaca, 11th; Buffalo, 14th, 15th, 20th; Mountainville and Syracuse, 20th.

North Carolina.—Fort Macon, 5th, 23d; Kitty Hawk and Weldon, 21st; Smithville and Wilmington, 23d.

Ohio. Wauseon, 4th, 5th, 8th, 19th to 23d, 27th, 28th; Garrettsville, 20th; Toledo, Westerville, and Tiffin, 27th.

Oregon.-Roseburg, 9th; East Portland, 19th.

Pennsylvania.—East Brook, 3d, 11th, 20th, 21st, 25th, 27th; Philadelphia, 9th, 21st; Pittsburg, 21st; Erie, 27th. South Carolina.—Stateburg, 7th, 20th, 23d, 27th, 28th.

Tennessee.—Nashville, 1st, 5th, 9th, 12th, 19th, 21st, 27th;

Chattanooga, 1st, 30th. Texas.—Fort Stockton, 11th.

Vermont.-Strafford, 9th, 11th, 22d.

Virginia.—Lynchburg, 2d, 20th; Fort Myer, 4th, 6th, 21st; Variety Mills, 6th, 13th, 21st; Dale Enterprise, 4th, 19th, 21st, 29th; Cape Henry, 21st.

Washington Territory.-Port Angeles, 5th, 23d, 25th; Walla Walla, 9th, 18th; Tatoosh Island, 23d.

Wyoming.—Fort Bridger, 20th, 24th, 30th.

LUNAR HALOS.

Lunar halos were observed in the various states and territories during the month, as follows:

Alabama.—Birmingham, 10th; Mobile, 12th, 13th.

Arkansas.-Fort Smith, 6th, 16th.

California.—Salinas, 8th; Fort Bridger, 20th.

Colorado.-Pike's Peak, 17th.

Connecticut.—New London, 21st.

District of Columbia .- Washington City, 11th, 13th.

Florida.—Sanford, 7th, 14th; Čedar Keys, 10th, 14th, 16th; Archer, 14th; Jacksonville, 14th, 15th; Key West, 17th.

Georgia.—Atlanta, 10th; Augusta, 15th.

18th; Sycamore, 10th; Riley, 10th, 12th; Springfield, 12th. Indiana.-Jeffersonville, 9th, 12th; Greencastle, Indian-

apolis, and Terre Haute, 12th.

Indian Territory .- Fort Sill, 16th.

Iowa.-Des Moines, 12th.

Kansas.—Sterling and El Dorado, 15th.

Kentucky .- Frankfort, 7th, 8th, 9th, 12th; Louisville, 10th. Maine.—Orono, 12th.

Massachusetts.—Amherst, 20th; Boston, 22d.

Michigan .- Grand Haven, 6th.

Minnesota.—Moorhead, 10th; Saint Vincent, 23d. Missouri.—Saint Louis, 7th.

Nebraska.—De Soto, 11th.

New Hampshire.—Nashua, 22d.

New Jersey .- Egg Harbor City, 11th; Atlantic City, 11th, 12th.

New York.—Ithaca, 13th, 20th.

North Carolina .- Kitty Hawk, 6th.

Ohio.-Cleveland, 13th; Napoleon, 15th.

Rhode Island. - Block Island, 11th, 21st.

South Carolina.-Spartanburg, 7th, 8th, 9th, 13th, 15th; Stateburg, 7th, 8th, 10th, 13th.

Tennessee .- Milan, 5th, 19th; Paris, 6th, 9th, 12th; Nashville, 7th, 10th; Austin and Chattanooga, 10th; Ashwood,

12th. Texas .- Galveston and Rio Grande City, 9th; Brownsville, 10th; Cleburne and Palestine, 11th, 12th; Fort Elliott, 12th,

13th; Corsicana, 13th; San Antonio, 14th. Virginia.—Cape Henry, 7th, 8th; Bird's Nest, 8th; Lynchburg, 9th, 11th, 13th; Variety Mills, 13th; Dale Enterprise,

The phases of the moon (Washington mean time) during June, as given in "The American Ephemeris and Nautical The following Almanac" for 1886, are as follows: New moon, 1st, 20 h. 47.1 of June 12, 1886:

New Jersey .- Egg Harbor City, 20th; Atlantic City, 21st; m.; first quarter, 8th, 14 h. 18.5 m.; full moon, 15th, 20 h. 30.6 m.; last quarter, 23d, 23 h. 26.6 m.; apogee, 20th, 23.8 h.; perigee, 5th, 5.7 h.

MIRAGE.

Webster, Dakota, 3d, 4th, 5th, 9th, 11th.

Duluth, Minnesota, 7th.

Port Angeles, Washington Territory, 13th.

Egg Harbor City, New Jersey, 20th.

MISCELLANEOUS PHENOMENA.

DROUGHT.

Key West, Florida: on the 6th 1.08 inches of rain fell, breaking the drought which had prevailed since May 1st.

Lamar, Missouri: the severe drought which had prevailed in this vicinity was broken on the 12th by a heavy rain which was of great value to crops. Farmers claim that the rain destroyed the chinch bug, which had previously existed in large numbers.

Owatonna, Steele county, Minnesota, 15th: crops were beginning to suffer serious injury from drought, wheat in many

fields having turned yellow.

Geneva, New York, 18th: in the region between Seneca Lake and Lake Erie very little rain fell during the first half of the month. The ground was very dry and hard, not having enough moisture in places to germinate seed.

Gardiner, Kennebec county, Maine: on the 26th and 27th 1.10 inches of rain fell, greatly benefiting vegetation which had been suffering from drought, only 0.74 inch of rain having fallen

from the 1st to the 26th.

Fort Madison, Lee county, Iowa, 30th: very little rain has fallen during the month; pastures and meadows are suffering from drought.

Cedar Rapids, Linn county, Iowa, 30th: the month has been exceptionally hot and dry, the monthly rainfall amounting to

only 1.25 inches.

Des Moines, Iowa, 30th: crops in this vicinity were suffer-Illinois.—Cairo, 6th, 9th; Windsor, 7th, 12th; Pekin, 7th, ing from a drought as no heavy rains had fallen during the month. Wheat ripened before it was matured in consequence of the continued heat and lack of moisture.

Fargo, Cass county, Dakota, 30th: reports from nearly all parts of the territory indicate an extensive and severe drought. Mandan, Morton county, Dakota, 30th: the continued dry

weather had seriously injured the wheat crop.

Abilene, Texas, 30th: the dry weather still continues and is Louisiana.-New Orleans, 12th, 13th; Grand Coteau, 18th. having a damaging effect on agricultural and stock-raising interests. Thousands of sheep have died from want of water

Geneseo, Henry county, Illinois, 30th: in this vicinity dry weather has prevailed throughout the month, ruining pasturage

on the uplands.

Birmingham, Oakland county, Michigan, 30th: severe

drought prevailed in this vicinity during the month.

Madison, Wisconsin: at the end of the month crops were much damaged from lack of moisture. A drought which had continued throughout the month had so injured crops that the yield will be much diminished. Winter wheat was prematurely ripened and corn was turning yellow.

EARTHQUAKES.

Port Antonio, Jamaica: on the 2d two shock of earthquake were felt, of about twenty seconds' duration. No damage was done.

San Francisco, California: on the 7th, at 4.13 p. m., a slight trembling motion of the earth was felt, followed by a sharp shock of about ten seconds' duration.

Oakland, California: on the 7th, at 1.31 p. m. (local time), a sharp shock of earthquake was felt. Windows were rattled and hanging objects were swayed back and forth in the direction of the vibrations, which were from west to east.

Antigua, West India Islands: sharp shocks of earthquake were felt on this island, and also at Saint Kitt's, on the 10th.

The following is from the Portland, Maine, "Daily Press,"

London, June 11.—The latest advices from Auckland, New Zealand, state | peared at an elevation of about 30°. It was equal in brilliance that the volcanic eruption at Tera-Wera destroyed entire villages in the district to a star of the second magnitude. by swiftly burying them in ashes. The surface of the earth for many miles around the active volcano was disturbed by the earthquake which accompanied the eruption. Twenty-six dead bodies have already been recovered from the

FOREST AND PRAIRIE FIRES.

Eau Claire, Eau Claire county, Wisconsin: reports from the Immber districts bordering on the Flambeau, Deer Tail, Soft: Maple, and other streams, state that disastrous forest fires had been burning in those districts during May 30th and 31st and June 1st. The fires were extinguished by a copious rainfall during the afternoon of the 1st.

Pentwater, Oceano county, Michigan: from the 1st to the 5th, inclusive, disastrous forest fires prevailed in this vicinity.

The forests were also burning on the 30th.

Los Angeles, California: on the 18th, at San Fernando, 2.000 acres of wheat were destroyed by fire. On the 30th three hundred acres of wheat were burned at Athlone.

Saint John, New Brunswick: during June the province has been suffering from drought, and on the 23d forest fires were burning along the line of the Inter-colonial railroad. Considerable damage was done at the stations of Berry's Mills and ; Painsic Junction.

Saint Vincent, Minnesota: prairie fires, 5th, 6th.

Thornville, Michigan: forest fire, 17th. Fort Bowie, Arizona: forest fire, 21st. Linkville, Oregon: forest fire, 21st.

INSECTS.

Cameron, Milam county, Texas, 4th: reports from the interior of this county state that grasshoppers have appeared in large numbers and crops are being destroyed by them.

Rochester, New York, 12th: the black and white aphis have been doing great damage to plum and cherry trees throughout western New York; searcely a tree in this section has escaped

Guilford, Connecticut, 19th: cut worms have completely destroyed the onion crop; the loss in this town is heavy and would have been greater had the worms appeared earlier in the season.

Vandalia, Fayette county, Illinois, 28th: in the eastern and southeastern parts of this county chinch-bugs have become

very numerous and destructive.

Rome, Oneida county, New York, 30th: reports from Oswego county state that the hop vine, which is cultivated generally throughout that section, is covered with the aphis, or plant louse. A varnish-like substance, called by the farmers "honey-dew," is also found wherever the lice are and is as destructive. Amherst, Massachusetts, furnishes the following record of sun as the vermin. The leaves and other parts of the vine attacked spots for June, 1886: by the lice and honey-dew curl up, and mould follows before the hop blossoms mature.

Syracuse, New York, 30th: fruit trees in this vicinity have been attacked by the black aphis, accompanied by the blight

called honey-dew.

Hillsborough, Montgomery county, Illinois, 30th: chinchbugs have appeared in this section in large numbers, and are doing considerable damage to crops, especially corn.

Poplar River, Montana, 30th: owing to the prevailing drought grasshoppers and potato bugs are becoming very numerous and destructive.

METEORS.

Sterling, Rice county, Kansas: on the 8th, at 10 p. m., a 30, 9 very large and bright meteor was seen moving across the southern portion of the sky; it moved very swiftly and exploded with a loud report.

sky and burst when 3° above the earth; no report was heard, 30th. but fragments were seen flying off in all directions.

Cahuenga, Los Angeles county, California: on the 18th, at 8.33 p. m., a meteor started from a point due south, about 10° weather for the succeeding twenty-four hours, have been ob-

Meteors were also reported, as follows:

Dover, New Jersey, 1st.

Vevay, Indiana, 1st. Cairo, Illinois, 5th.

Sterling, Kansas, 8th.

Davenport, Iowa, 9th. Milan, Tennessee, 11th.

Lead Hill, Arkausas, 11th, 23d, 26th, 28th.

Manatee, Florida, 17th.

Salt Lake City, Utah, 17th.

Cleburne, Texas, 18th, 20th.

Monticello, Iowa, 20th.

Egg Harbor City, New Jersey, 20th, 28th, 29th.

Mountainville, New York, 26th, 27th, 29th.

Wauseon, Ohio, 27th.

Limona, Florida, 28th.

Clayton, New Jersey, 29th.

MIGRATION OF BIRDS.

Geese flying northward .- Rio Grande City, Texas, 6th. Ducks flying northward.—Saint Vincent, Minnesota, 8th.

POLAR BANDS.

Polar bands were reported during the month by the following stations:

Nashville, Tennessee, 4th, 10th, 19th.

Cairo, Illinois, 17th.

Prescott, Arizona, 3d. Archer, Florida, 16th.

Ninnescah, Kansas, 1st, 6th, 18th.

Gardiner, Maine, 29th. Amherst, Massachusetts, 4th, 29th.

Syracuse, New York, 30th.

Wauseon, Ohio, 13th, 30th.

Yellow Springs, 4th.

Napoleon, Ohio, 10th, 26th. Wytheville, Virginia, 30th.

SAND STORMS.

Abilene, Texas, 29th.

Yuma, Arizona, 10th, 11th, 12th, 24th.

Maricopa, Arizona, 2d, 11th.

Fort McDowell, Arizona, 8th.

Fort Huachuca, Arizona, 7th.

SUN SPOTS.

Date— June, 1886.		No, of new,		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Standard time.	Gr'ps	Spots	Gr'ps	Spots	Gr'psi	Spots	Gr'ps	Spots	
	 1. 1 p. m	u							•••	
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	10, 3 p. m		0	••••••	• • • • • • • • • • • • • • • • • • • •			2	12	
	16, 3 p. m	ı	ı		·	·	· · · · · · · · · · · · · · · · · · ·	I	ı	
	20, 3 p. m	3	11	o	o	••••••	••••••	4	12	
	27. 10 a. m		-•	· · · · · · · · · · · · · · · · · · ·		·		5	20	Spots mostly small.
	28, 4 p. m	I	3	0	. 0	1	3	5	20	•
Ì	30, 9 n. m	O	401		1	·		3	· 55Î	

Faculæ were seen at the time of every observation.

1Approximated.

Mr. H. D. Gowey, of North Lewisburg, Champaign county, Fort Elliott, Texas: a meteor was observed at 10.25 p. m. Ohio, reports having observed sun spots on the following dates: of the 8th. It started at an altitude of about 35° in the eastern 1st, 3d to 8th, 11th, 12th, 17th, 19th, 23d to 26th, 28th, 29th,

above the horizon, and moved toward the east, where it disap- served at all Signal Service stations. Reports from one hun-

dred and flfty-one stations show 4,510 observations to have been made, of which five were reported doubtful; of the rethe expected weather.

WATER-SPOUTS.

mean time of June 4th, saw three large water-spouts, moving ascertained from the tri-daily reports. in a ssw. direction.

Steamship "Stroma," reports: June 4th, in N. 32° 38', W. rushed in close proximity to the vessel.

Indianola, Texas: on the 8th a water-spout passed over Powder Horn Lake, a small body of water lying west of the easterly winds; of these, four, or 19.05 per cent., were justified town.

VERIFICATIONS.

INDICATIONS

In the table below are shown the percentages of indications verified for the months July to October, 1885, inclusive. The percentages for July and August, 1885, as published in the viously. The indications for July, eighteen days of August, and for September were verified by 2d Lieutenants Joseph S. Powell and J. E. Maxfield, Signal Corps, U. S. Army, Assistants, and Prof. Cleveland Abbe, Assistant; the remaining justified signals had they been displayed. thirteen days of August were verified by 1st Lieut. H. H. C. COLD-WAVE SIGNALS. Dunwoody, 4th Artillery, Acting Signal Officer and Assistant, 2d Lieut. W. A. Glassford, Signal Corps, U. S. Army, Assistant, and Prof. Cleveland Abbe, Assistant. The indications for October were verified by 1st Lieut. T. M. Woodruff, 5th Infantry, Acting Signal Officer and Assistant, and 2d Lieut. W. A. Glassford, Signal Corps, U. S. Army, Assistant:

Percentages of indications verified—July to October, 1885.

2 37 414 13		• • • • • • • • • • • • • • • • • • • •		
- · · - ·	July,	August.	September.	October,
			• · · · · · · · · · · · · · · · · · · ·	•
By districts:	Per cent.	Per cent.	Per cent.	Per cent.
New England	63.58	72.79	82.24	75.84
Middle Atlautic states	74.01	73.86	80.60	79.85
South Atlantic states	79.39	70.51	83.97	88.35
East Gulf states	83.27	75.80	80.72	84.65
West Gulf states	80.95	73.56	81.72	81.75
Lower lake region	70.89	75.00	76.15	77 - 43
Upper lake region	73 - 53	72.57	75.07	74.13
Tennessee and Ohio Valley	72.84	74.55	75.49	80.42
Upper Mississippi valley	73.01	76.32	76.45	77 - 54
Missouri Valley	71.00	70.55	73.06	77.52
North Pacific coast region	88.45	91.37	82.59	66.95
Middle Pacific coast region	92.69	91.23	89.73	80.75
South Pacific coast region	95-47	93 - 57	93.60	91.38
By elements:		i _		_
Weather	78.56	79.84	86,61	84.53
Wind	74 - 59	70.30	75.52	77.11
Temperature	78.86 I	80.00	77.22	75.66
Barometer	≿2.78	87.08	81.51	81.59
General averages	77-44 Í	76.90	79.95	79.69

The detailed comparison of the tri-daily indications for June. 1886, with the telegraphic reports for the succeeding thirty-two hours, shows the general average percentage of verifications to be 73.07. The percentages for the different elements are: Weather, 77.71; wind, 67.66; temperature, 73.86. By states, etc., the percentages are: For Maine, 67.22; New Hampshire, 67.50; Vermont, 67.13; Massachusetts, 67.69; Rhode Island, 69.54; Connecticut, 70.74; New York, 75.37; Pennsylvania, 73.15; New Jersey, 77.96; Delaware, 78.52; Maryland, 77.59; Virginia, 77.69; North Carolina, 75.28; South Carolina, 76.11; Georgia, 78.61; Florida, 69.17; Alabama, 76.57; Mississippi, 78.52; Louisiana, 76.11; Texas, 77.59; Arkansas, 73.33; Tennessee, 76.76; Kentucky, 70.65; Ohio, 73.70; West Virginia, 65.19; Indiana, 70.83; Illinois, 73.13; Michigan, 73.41; Wisconsin, 70.09; Minnesota, 70.00; Iowa, 66.02; Kansas, 69.91; Nebraska, 71.67; Missouri, 72.86; Colorado, 78.89; east Dakota, 72.99; north Pacific coast region, 68.75; middle Pacific coast region, 79.76; south Pacific coast region, 81.99.

There were eight omissions to predict, out of 9,864, or 0.01 per cent. Of the 9,856 predictions that have been made, eight mainder, 4,605, there were 3,844, or 83.5 per cent., followed by hundred and ninety-six, or 9.09 per cent., are considered to have entirely failed; five hundred and ninety four, or 6.03 per cent.. were one-fourth verified; 1,893, or 19.21 per cent., were one-half The steamship "Clement," Thomas Burley, commanding, verified; 1,463, or 14.84 per cent., were three-fourths verified; reports: in N. 19° 29′, W. 59° 14′, at 22 h. 26 m., Greenwich acceptained from the tri-daily reports. verified; 1,463, or 14.84 per cent., were three-fourths verified;

CAUTIONARY SIGNALS.

During June, 1886, there were fifty-nine signals of various 75° 35', passed two water-spouts to the westward, one of which kinds ordered, of which number, eleven, or 20.34 per cent., were fully justified both as to direction and velocity. Of the signals above mentioned twenty-one were ordered for northboth as to direction and velocity, and twelve, or 57.14 per cent., were justified as to velocity only. Sixteen signals were ordered for southeasterly winds, and two, or 12.50 per cent., were justified both as to direction and velocity. Seven signals were ordered for southwesterly winds, and three, or 42.86 per cent.. percentages for July and August, 1885, as published in the were justified both as to direction and velocity. Thirteen sig-Monthly Weather Review for those months, have been mals were ordered for northwesterly winds; of these, two, or revised, with results as given in this table. The percentages 15.38 per cent., were justified both as to direction and velocity, for October and November, 1885, have not been published pre- and three, or 23.08 per cent., were justified as to velocity only. Two cautionary signals were ordered (for no specified direction) and neither was justified.

In twenty-two cases winds were reported which would have

COLD-WAVE SIGNALS.

No cold-wave signals were ordered during June.

RAILWAY WEATHER SIGNALS.

Prof. P. H. Mell, jr., director of the "Alabama Weather Service," in the report for June, 1886, states:

The verifications of predictions for the whole area was 93 per cent, for temperature, and 87 per cent. for weather.

temperature, and 87 per cent. for weather.

The following corporations comprise this system: South and North; Montgomery and Mobile: Mobile and Girard: Georgia Pacific; East Tennessee, Virginia and Georgia system in Alabama; Memphis and Charleston; Columbus and Western; Atlanta and West Point of Georgia; Northeastern of Georgia; Western and Atlantic: East Tennessee, Virginia and Georgia system in Georgia; Montgomery and Enfaula: Pensacola and Selma; Pensacola and Atlantic; and the cities of Milledgeville, Georgia, and Talladega, Alabama.

LOCAL WEATHER SIGNALS.

Prof. Winslow Upton, director of the "New England Meteorological Society," in the report for June, 1886, states:

The verification of weather signals at New Haven was 83 per cent, for temperature, 93 for weather; at fourteen other stations reporting to the secretary, 92.3 for temperature, 83.5 for weather. Local predictions made at Blue Hill gave 70 per cent. for rains, 90 for weather.

Prof. Goodwin D. Swezey, director of the "Nebraska Weather Service," in the report for June, 1886, makes the percentage of verifications for temperature in the state 86.7. and weather 82.7.

Meteorological record of voluntary observers and Army post surgeons, June. 1886.

	. Te	mpera	ature.	Ten			
Stations.	Maximum.	Minimum,	Мемп.	 	Stations. Stations.	Minimum. 	Rainfall.
Alabama. Birmingham * Greensborough Mount Vernon B'ks. Arizona. Huachuca, Fort Lowell, Fort Arkanas. Lead Hill * Californa. Alcatraz feland Angel Island Benicia Barracks Bidwell, Fort	96 101 110 113 101 72 93 86	60 66 63 47 52 52 52 48 51 55 33	1	1nches 7.08 6.73 7.41 0.00 0.00 0.00 5.43 0.00 0.00 0.00	California Cont'd Calmenga Gaston, Fort 98 Hydewille Mason, Fort 76 Muricita 98 Nicolaus 100 Oakland 79 Oroville 95 Presidio of San F 77 Princeton 103 Sacramento 99 Salina 71 Susanville 93 Susanville 93 Susanville 93 94 95 94 95 95 95 95 95	43 67.4 53 62.3 48 65.0 58 75.4 53 60.8 62 79.1 60 67.2 45 57.0 51 73.4 51 77.3 51 57.0 51 77.3 66.0	Inches 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.